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THE MARKET FOR COTTON TEXTILES IN BAGS

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Cotton bags are textile products which are rarely if ever posed in swank display rooms and which are seldom depicted in slick paper magazines. Yet they rank A-1 when it comes to consuming huge quantities of cotton fabrics--so much so that cotton textile manufacturers and cotton growers would do well to keep posted on developments in this field. In this report some of the current trends in the bag business are discussed and an attempt is made to forecast what lies ahead.

Bags as a Market for Cotton Textiles

According to the best available estimates, the quantity of cotton fabrics cut up into bags climbed from 816 million yards in 1939 to 1,283 million yards in 1943, then declined to about 700 million yards in 1946 (table 1, figure 1). These yardages required, respectively, 505,000, 820,000, and 440,000 bales of cotton to manufacture. Before the war, bags were the third largest end use of cotton, ranking after tire cord and shirts[2/]; but for a time during the war, it is likely that bags consumed more cotton than any other product. In 1946, 8.0 percent of the nation's production of cotton broad woven goods was cut up into bags, with bags accounting for 4.5 percent of the total cotton consumption during that year.

Comparative Consumption of Cotton and Other Materials in Bags.

Back in 1939, an estimated 26 percent of all bagged commodities were packaged in new cotton bags, about 23 percent in new burlap bags, and about 20 percent in multiwall paper bags. The remaining 31 percent was handled in re-used bags, cartons, etc., or by bulk handling methods (table 2). Then came the war. Bags were needed in ever-increasing quantities for packaging food, feed, and other war essentials. At the same time, imports

1/ Acknowledgment is made of the considerable assistance given by Bemis Bro. Bag Co., Chase Bag Co., the Textile Bag Manufacturers Association, and the Paper Shipping Sack Manufacturers Association.

2/ Page 2, Cotton Counts Its Customers. M. K. Horne, Jr., and Frank A. McCord. Memphis, Tenn. National Cotton Council of America, 31 pages, 1942.

Table 1. - Quantities of cotton fabric, burlap, and shipping sack paper used in bags in the United States, 1939-46 and cotton equivalents.

Year	Quantities 2/						Cotton equivalents 3/		
	Cotton fabric	Burlap	Paper	Cotton fabric	Burlap	Paper	Cotton fabric	Burlap	Paper
	Million yards	Million yards	1,000 tons	Index	Index	Index	1,000 bales	1,000 bales	1,000 bales
1939	816	712	201	100	100	100	505	451	392
1940	890	648	195	109	91	97	548	410	380
1941	927	620	270	114	87	134	573	392	526
1942	1,183	306	251	145	43	125	728	194	489
1943	1,283	373	315	157	52	157	820	236	614
1944	1,052	609	392	129	86	195	662	385	764
1945	938	826	424	115	116	211	588	523	827
1946 1/	702	897	500	86	126	249	440	568	975

1/ Preliminary.

2/ Cotton fabric and burlap totals are estimates of the Textile Bag Manufacturers' Association. Paper totals are quantities of shipping sack paper manufactured as compiled by the Bureau of the Census except for 1939 and 1940, which are estimated consumption figures compiled by the War Production Board, and for 1946, which is estimate of Paper Shipping Sack Manufacturers' Association.

3/ Cotton equivalents of cotton fabrics have been calculated on the basis of bag constructions most generally used, allowing for non-cotton content and waste. For burlap and paper, estimates are on basis of replacement of bags made of these materials by cotton bags now used for same commodities or by typical cotton bags. Bales are 478 pounds net.

of burlap, our mainstay for many types of bags, were greatly reduced and made highly precarious by enemy action. The burden of replacing burlap and at the same time meeting increased requirements fell in large part on cotton. Paper bags, however, also became increasingly important, the quantity of paper used for this purpose increasing from 201,000 tons in 1939 to 315,000 tons in 1943.

After 1943, greatly increased quantities of both burlap and multiwall paper bags became available and, although the total production of bags continued to increase during 1944 and 1945, the consumption of cotton fabrics in this use declined substantially. In 1945, the percentage of the bag market held by both cotton and burlap was slightly smaller than in 1939, but paper's share had increased from 20 to 32 percent (figure 2).

Preliminary data for 1946 indicate that consumption of cotton fabrics is now less than in 1939, but that the consumption of both burlap and paper is continuing to climb. These trends may have serious long-term reprocussions on the market for cotton and cotton textiles.

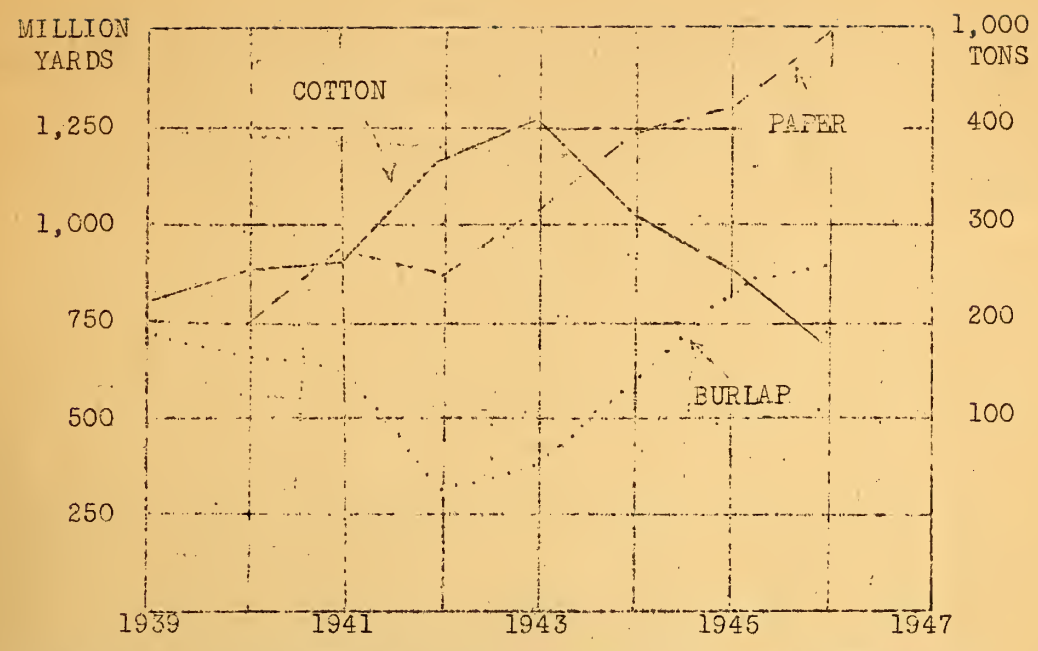

FIGURE 1. -- QUANTITIES OF COTTON FABRIC, BURLAP, AND SHIPPING SACK PAPER USED IN BAGS, UNITED STATES, 1939-1946.

Estimated Demand for Cotton Bags in 1950

Turning now from the past and present to the future, estimates of how much cotton and cotton fabrics will be used in bags for packaging various commodities in 1950 are given in table 3. It is assumed that by 1950 the postwar reconversion period will be over, wartime shortages will be memories, and typical peacetime competitive conditions will again prevail in business. Two sets of estimates have been made--one set assuming high prosperity, and the other, moderate prosperity. Both are compared with data for 1939 and 1945. There is nothing sacred or final about these estimates; they are merely efforts to size up the situation as it appears at present.

Total quantities of packaging materials needed to handle various commodities naturally vary from year to year with changes in production or shipments. In order to provide estimates for 1950, analyses were made of the trends and factors involved in the use of commodities which are bagged and expert opinion was secured regarding prospects for the future. It should be noted in this connection that the great bulk of cotton bags are used for handling products of agriculture, which fluctuate less in volume from prosperity to depression than do industrial products generally.

Table 2. - Relative importance, in terms of cotton equivalents, of cotton, burlap, paper, and other containers for handling bagged commodities, United States, 1939 and 1945.

Year	Cotton	Burlap	Paper	Others 1/	Total
	1,000 bales	1,000 bales	1,000 bales	1,000 bales	1,000 bales
1939	505	451	392	610	1,958
1945	588	523	827	642	2,580
	Percent	Percent	Percent	Percent	Percent
1939	26	23	20	31	100
1945	23	20	32	25	100

1/ Including re-used bags, cartons, barrels, bulk handling, etc. Estimated. See table 1 for derivation of totals for cotton, burlap, and paper, and for method of calculating cotton equivalents. Totals for "Others" calculated on basis of percentages thus packaged of commodities where fabric bags are now a factor.

Although the expected trends vary somewhat with each commodity (table 3), it was found that the aggregate total need for all packaging materials in 1950 can be expected to be slightly greater than in 1945 if business conditions are highly prosperous, and slightly less if there is only moderate prosperity. In either case, a much larger total market for packaging materials than in 1939 can be counted upon.

The next question is, "How much of this market will be held by cotton?" The answer obviously depends upon how well cotton fares in competition with paper bags, bulk handling methods, burlap bags, and other substitutes.

Although consumption of cotton in bags was greater than ever before during the war, paper bags in the last five years have been able to replace cotton bags to a considerable extent for packaging such important commodities as sugar and flour. The trend toward packaging these and other foods in small retail packages at the point of manufacture has been important in this connection, and at the same time the use of paper in large bags also has increased. Use of paper bags in place of cotton has been aggravated by wartime shortages of cotton fabrics. This trend toward paper is expected to continue during the next few years, although it will not be important in bags for certain commodities. Shortages of wood pulp may tend to minimize, but will not change, the tendency in this direction.

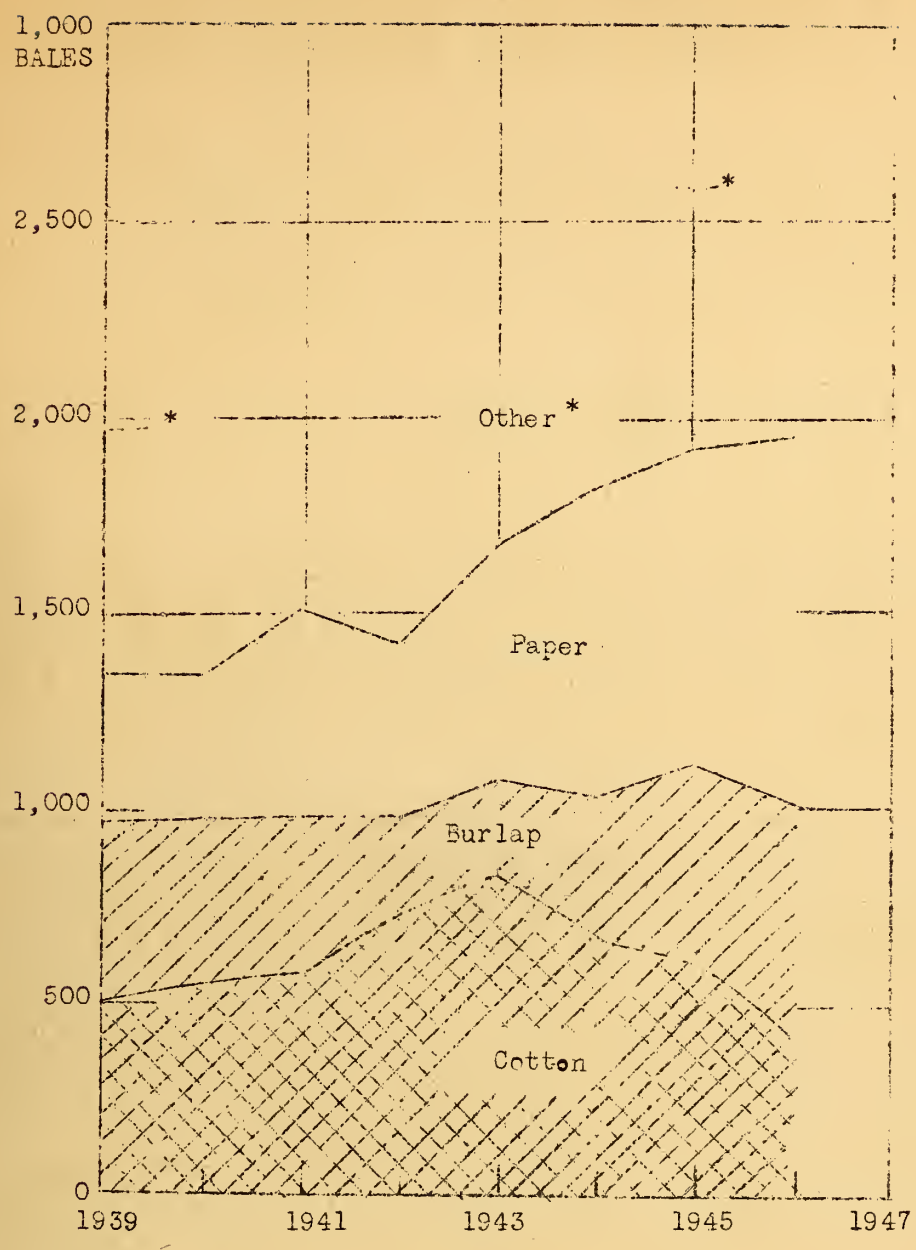

Figure 2. -- RELATIVE IMPORTANCE, IN TERMS OF COTTON EQUIVALENTS, OF COTTON, BURLAP, PAPER, AND OTHER CONTAINERS* FOR HANDLING BAGGED COMMODITIES, UNITED STATES, 1939-1946.

*Including re-used bags, cartons, barrels, bulk handling for commodities where fabric bags are now a factor. No data for other than 1939 and 1945 only.

Table 3. - Cotton in bags: Percentages of various commodities packaged in cotton bags, consumption of cotton cloth and raw cotton in bags, United States, 1939 and 1945, with projections for 1950 assuming high and moderate prosperity, 1/

Commodity and Year	Quantity of commodity	Percent in cotton bags	Consumption of cotton cloth	Consumption of raw cotton
		Percent	[illegible] bales	[illegible] bales
FEED (mixed and mill)				
1939	25 million tons	20	125	78
1945	40 million tons	36	377	237
1950, high prosperity	40 million tons	43	459	286
1950, moderate prosperity	36 million tons	44	413	260
Mixed feed				
1945	31 million tons	44	347	218
1950, high prosperity	31 million tons	55	438	275
1950, moderate prosperity	28 million tons	55	396	249
Mill feed				
1945	9 million tons	12	30	19
1950, high prosperity	9 million tons	8	21	13
1950, moderate prosperity	8 million tons	8	17	11
FLOUR				
1939	105 million barrels	57	206	104
1945	136 million barrels	56	236	113
1950, high prosperity	122 million barrels	42	159	76
1950, moderate prosperity	122 million barrels	42	159	76
SUGAR				
1939	6.0 million tons	77	145	82
1945	5.5 million tons	42	84	45
1950, high prosperity	6.9 million tons	30	77	41
1950, moderate prosperity	6.9 million tons	30	77	41
MEAL (other than corn meal)				
1939	3.8 million tons	4	3	2
1945	7.1 million tons	6	10	6
1950, high prosperity	6.0 million tons	4	7	4
1950, moderate prosperity	6.0 million tons	4	7	4
CORN MEAL				
1939	15.8 million barrels	18	13	4
1945	15.0 million barrels	16	10	3
1950, high prosperity	17.0 million barrels	16	13	4
1950, moderate prosperity	17.0 million barrels	16	13	4

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(continued)

Commodity and year	Quantity of commodity	Percent in cotton bags	Consumption of cotton cloth	Consumption of raw cotton
		Percent	Million l. yards	1,000 bales
SEED				
1939	5 billion pounds2/	52/	31	37
1945	7 billion pounds2/	332/	38	36
1950, high prosperity	7 billion pounds	33	38	36
1950, moderate prosperity	7 billion pounds	33	38	36
CEMENT				
1939	491 million bags	35	23	23
1945	411 million bags	9	5	5
1950, high prosperity	900 million bags	5	6	6
1950, moderate prosperity	800 million bags	5	5	5
FERTILIZER				
1939	7.7 million tons	13	19	18
1945	13.2 million tons	11	28	32
1950, high prosperity	13.0 million tons	11	31	36
1950, moderate prosperity	12.0 million tons	11	29	33
SALT				
1939	4.7 million tons3/	16	18	11
1945	7.2 million tons3/	29	54	39
1950, high prosperity	6.5 million tons3/	20	33	24
1950, moderate prosperity	5.9 million tons3/	20	30	22
POTATOES				
1939	230 million bushels	4	7	4
1945	320 million bushels	2	5	3
1950, high prosperity	270 million bushels	2	3	2
1950, moderate prosperity	270 million bushels	2	3	2
OTHER				
1939	-	19	226	142
1945	-	9	91	69
1950, high prosperity	-	8	76	58
1950, moderate prosperity	-	9	70	53

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(continued)

Commodity and year	Quantity of commodity	Percent in cotton bags	Consumption of cotton cloth	Consumption of raw cotton
		Percent	Million l. yards	1,000 bales
TOTAL				
1939	-	26	816	505
1945	-	23	938	588
1950, high prosperity	-	22	902	575
1950, moderate prosperity	-	23	844	536

1/ Data for 1939 and 1945 are generally estimates based on bag production statistics compiled or estimated by the Textile Bag Manufacturers' Association, the Paper Shipping Sack Manufacturers' Association, the War Production Board, and the War Food Administration; and on available data regarding commodity packaging practices. Because of inadequacies in the basic data, estimates for some commodities are subject to wide margins of error. Projections for 1950 are based on analyses of trends in use of listed commodities and in packaging practices. They assume a 25 cent price per pound for cotton and approximately the same price relationships between cotton, burlap, and paper bags as prevailed at the beginning of 1946. High prosperity (1950) is defined as having an industrial production index of 180 and an agricultural production index of 135; moderate prosperity as having an industrial production of 150 and an agricultural production of 125, all on the basis of 1935-39 equaling 100.

2/ Based on quantity packaged in bags only.

3/ Dry salt only.

A trend toward bulk handling also must be taken into account. In 1925, 84 percent of all cement moved in cotton bags and only 7 percent was handled in bulk. In 1943, only 19 percent was packaged in cotton bags, 36 percent was packaged in paper bags, and 42 percent was handled in bulk. Bulk handling generally requires a much greater capital outlay for equipment than does packaging in bags, but where it is practicable to handle a material in large, homogeneous, bulk quantities it sometimes makes possible lower net handling costs.

Bulk handling methods already have replaced huge numbers of textile bags in the harvesting and handling of wheat and rice. They already have

assumed some importance for refined sugar--the sugar being carried in liquid form in tank cars[3], are now being tried out for flour[4], and are of growing importance in the handling of meals and other ingredients used in commercial mixed feeds. Although some further expansion in the use of bulk handling methods can be expected, they seem to offer no advantage for most requirements now met with bags.

Burlap bags are an old-time competitor of cotton bags, but in general, the competition is now static, each material having certain markets where it is preferred. Unless the price of cotton is out of line, there should be no continued market trend towards burlap and away from cotton during the next few years.

The trend away from cotton bags for packaging certain commodities is countered to a very considerable extent by a trend toward cotton bags for packaging mixed feeds. This use illustrates one of cotton's principal advantage as compared with other types of containers--its high salvage value. Despite a much higher price, most purchasers of mixed feed prefer cotton bags because of the salvage value of the fabric of which they are made for clothing and household uses. Bag manufacturers have increased the value of cotton bags for this purpose by using suitable fabrics and by distributing literature and otherwise stressing how bag fabrics can be used to advantage. With production of mixed feeds following an upward trend, mixed feed bags are becoming more and more important as a use for cotton. In 1945, 36 percent of all cotton bag fabrics were used for mixed feed bags.

Taking all of these factors into consideration, it is estimated that cotton bags will have about the same percentage of the bag market in 1950 as in 1945--which means that about 900 million yards of cotton cloth will be used if there is high prosperity and about 844 million yards of cloth if there is moderate prosperity. Both estimates are made on the basis of a cotton price of about 25 cents per pound.

Effect of Price

As indicated in table 4 and figure 3, cotton bags climbed in price during the war much more than did burlap and paper bags owing in large part to substantial increases in raw cotton prices. The increased price of cotton bags also reflected increased mill and bag manufacturers' margins. Ordinarily, bag users are highly price-conscious and are prone to switch readily from one type of bag to another with changing price relationships; but during the war, when they were anxious to get any kind of bags they could, prices were only of secondary importance. This attitude is changing rapidly as supplies of cotton fabric, burlap, and shipping sack paper become more plentiful in relation to demand. In this connection, it is

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3/ See "Liquid Sugars Offer the Food Processing Industries a New Opportunity to Streamline Production in Continuous Flow, Achieve Improved Sanitation and Better Quality." Robert Whymper. Food in Canada 5 (6) 32, 37-38 (June 1945)

4/ Handling and Transport of Flour in Bulk. Anonymous. American Miller and Processor 74 (6) 42,46,82-87 (June 1946).

Table 4. - Comparative prices of typical cotton, burlap, and paper bags and relative data, United States, August 1946 and March 1947. 1/

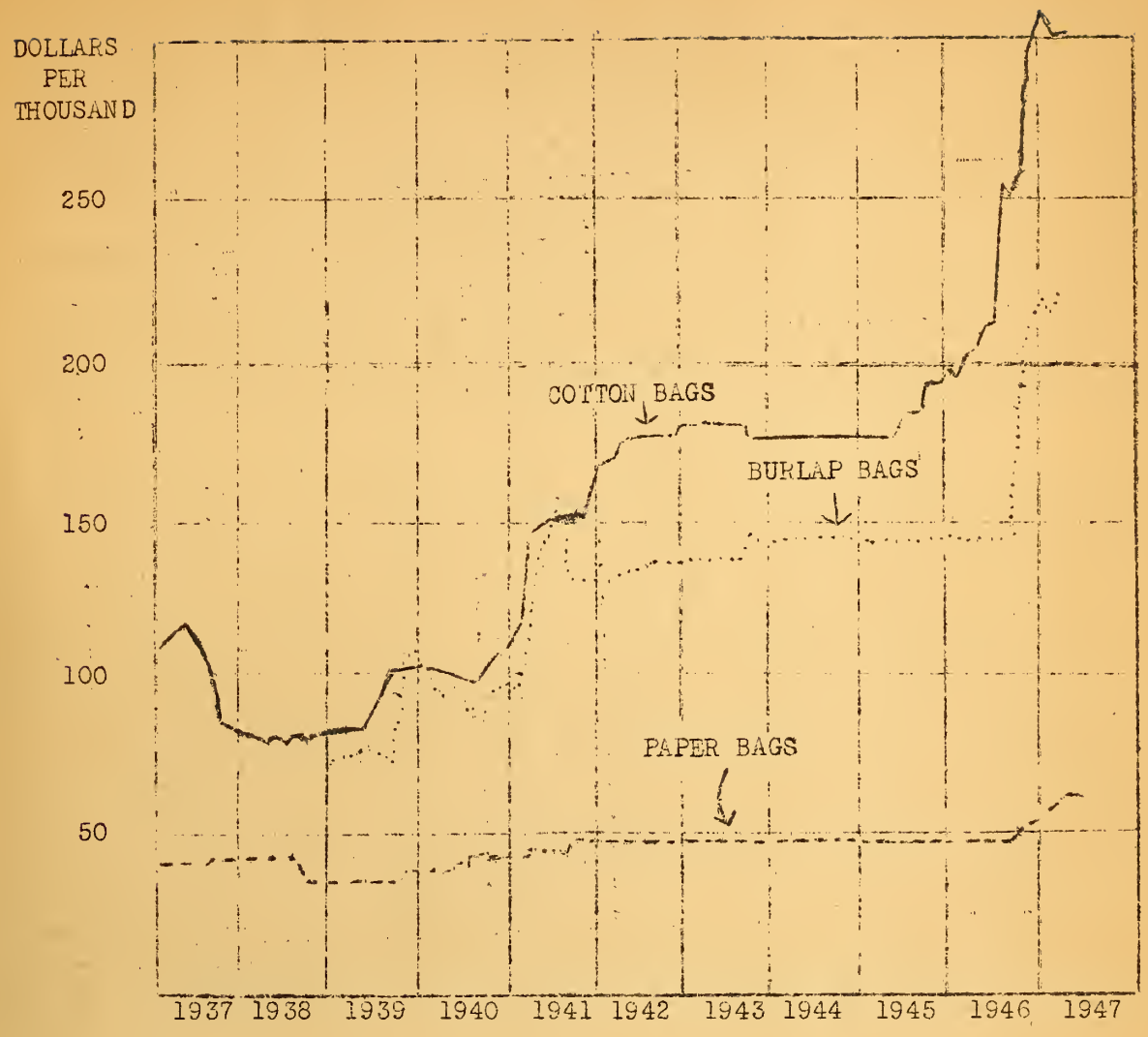
	Average 1940	Average 1943	August 1946	March 1947
Cotton cement bags 2/, dollars per 1,000	100.28	175.98	247.52	300.20
Paper cement bags 3/, dollars per 1,000	38.39	48.12	48.12	61.25
Burlap mixed feed bags 4/, dollars per 1,000	90.55	137.01	143.38	237.70
Osnaburg, 30" 7 oz., cents per yard	8.1	14.8	20.5	25.0
Burlap, 40" 7 1/2 oz., cents per yard	5.7	8.1	8.5	16.92
Cotton, Middling 15/16-inch 5/, cents per pound	10.17	30.60	35.49	34.84

1/ Bag prices are quoted to indicate trends rather than comparative economy, which depends on re-use value and quality factors as well as price.
2/ 94-lb. size, valve type, 30" 7 oz. Osna. cut 36", carload lots.
3/ 94-lb. size, 190# basis, 15-1/2 x 2 x 3 x 27-1/4.
4/ 100-lb. size, 40" 7 1/2 oz. cut 48".
5/ 10-market average.

Bag prices supplied by a large manufacturer; osnaburg prices from Bureau of Labor Statistics; burlap prices from Daily Mill Stock Reporter. Cotton prices from Production and Marketing Administration, Department of Agriculture.

important that cotton bag prices currently are far higher relative to prices of burlap and paper bags than they were before the war.

In our hypothetical peacetime year, 1950, it can be expected that much larger quantities of cotton and cotton fabrics will be used if their prices are low than if they are high. If in 1950 cotton were priced at 40 cents per pound, it is estimated that only about 477 million yards of cotton goods (the equivalent of 300,000 bales of cotton) would be used (table 5). On



FIBURE 3. - TRENDS IN PRICE OF TYPICAL COTTON, BURLAP, AND PAPER BAGS, 1937 - 1947 (See table 3 for description and sources)

the other hand, if the price of cotton were around 12 cents per pound, it is estimated that about 1 billion yards (equivalent to 660,000 bales of cotton) would be consumed. These estimates are on the basis of moderate prosperity and assume no outstanding changes in bag technology.

Significance of Quality

Bags are basic industrial goods meeting a demand for a covering material with adequate strength that will package a given commodity at an absolute minimum of cost. Appearance, durability, and resistance to moisture are also sometimes of importance, depending upon the commodity packaged, whether wholesale or retail handling is involved, and upon the physical conditions of storage, handling, and use. In addition, re-use and salvage values are frequently highly important. Since cotton bags

Table 5. - Estimated effect of the price of cotton on use of cotton fabrics in bags in 1950 (assuming moderate prosperity)

Commodity	Percent of commodity in cotton bags			Quantity of cotton fabric consumed		
	12 cent cotton	25 cent cotton	40 cent cotton	12 cent cotton	25 cent cotton	40 cent cotton
	Percent	Percent	Percent	Million yards	Million yards	Million yards
Feed	52	44	34	492	413	246
Mixed feed	65	55	34	467	396	246
Mill feed	12	8	0	25	17	0
Flour	48	42	28	182	159	105
Sugar	36	30	12	92	77	30
Meal(other than corn meal)	8	4	0	14	7	0
Cornmeal	20	16	8	16	13	7
Seed	43	33	25	50	38	28
Cement	7	5	3	7	5	3
Fertilizer	20	11	4	53	29	11
Salt	25	20	7	37	30	11
Potatoes	6	2	0	9	3	0
Other	11	9	4	88	70	36
Total	29	23	13	1,040	844	477

nearly always have been priced higher than both burlap and paper bags, they have been used only for those requirements where they have definite quality advantages.

Cotton and burlap bags may be used many times but paper bags, with exceptions, are used only once. If cotton bags are used for years, as is often the case with seamless flour and seed bags, or on an average of eight or more times, as is the case with cotton cement bags, their net cost per trip may be brought down considerably below the cost of paper bags. If bags are re-used, they ordinarily must be assembled, cleaned, mended if necessary, inspected, baled, and shipped. The cost of these operations has risen considerably during the last few years because of rising wage trends. As already mentioned, cotton bags also often have a high salvage value for clothing and household uses.

Being white and of smoother texture, cotton fabrics always have had an advantage over burlap bags whereever cleanliness was desired, and for this reason have been preferred for packaging foods. More recently, however, it has been stressed in advertising that paper is superior to cotton in this regard. Fabric bags do not provide a continuous surface as do paper bags and thus may be contaminated more easily under certain circumstances. If fabric bags are used more than once, the danger of contamination is also greater than with a one-use container. This point is being stressed at present in connection with bags for flour and sugar. Research to reduce the possibility of contaminating the contents of cotton bags is needed in order to protect cotton's important present market as a packaging material for foods.

Cotton bags have a considerable advantage over burlap bags, but not over paper, in most uses where appearance is important. They lend themselves to carrying brand names and other advertising. This feature is important in bags used to package branded commodities for sale to ultimate consumers and is particularly important if the commodity carried is high in unit value. On the other hand, cotton bags, unless dyed, do not compare well with burlap bags if the commodity is likely to stain the bag, as is the case with oilseed meals. It also has been stated that paper open-mesh bags are preferred to similar cotton bags for packaging farm commodities which are iced, because the moisture dissolves the sizing in the cotton threads and causes them to look sleezy. The development of special types of paper having higher wet strengths than formerly has been important in this and other uses.

Although paper bags sell for a lower price than cotton bags, they require more costly equipment to handle. Once the change is made, however, paper bags require less labor and are less costly to fill than cotton and other fabric bags. As a result, once a bag customer has installed equipment for using paper bags, he tends to use them regardless of changing bag prices. Temporary shortages and higher prices for cotton bags thus may have a permanent effect on the size of the market for cotton bags. In this connection, more automatic means of manufacturing and filling cotton bags are needed in order to reduce paper's advantage in this respect.

There probably will be no outstanding change in quality relationships between cotton and competitive bags during the next few years, but it can be expected that existing improvements in the specifications and handling of paper bags will be exploited more fully. Further minor improvements in paper bag technology also can be expected. In the face of this trend, cotton's competitive position in bags can be reinforced by increased attention to research and promotional activities. Considering cotton's stake in the bag business, present expenditures for these purposes are relatively small.

Summary

Consumption of cotton fabrics in bags climbed from 816 million yards in 1939 to 1,283 million yards in 1943, then declined to about 700 million yards in 1946. Bags accounted for about 8.0 percent of the cotton goods production and 4.5 percent of total cotton consumption in the United States in 1946. Assuming a price for cotton of 25 cents per pound, it is estimated that about 900 million yards of cotton cloth will be used in bags in 1950 if there is high prosperity and about 844 million yards if there is moderate prosperity; with the latter figure changing to 1 billion yards if cotton is 12 cents per pound and to 477 million yards if it is 40 cents per pound.

It is expected that consumption of cotton in bags will be adversely affected by trends toward using paper bags and bulk handling for some commodities, but that it will be favorably affected by a well sustained, overall demand for packaging materials and by a growing demand for cotton feed bags. Cotton's important market in bags can be reinforced by increased attention to research and promotional activities.

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